

Overview

The HP StorageWorks XP12000 Disk Array is an enterprise class storage system that delivers always-on reliability and availability for mission-critical applications where downtime is not an option. The XP12000 is designed for organizations that demand the most from their storage. Complete redundancy throughout the architecture provides no single-point-of-failure, and non-disruptive online upgrades ensure that data is always available.

The scalable design allows you to meet your capacity, performance, and heterogeneous connectivity needs today and tomorrow, without ever requiring a forklift upgrade. Outstanding levels of random and sequential performance are ideal for database, OLTP, Oracle, SAP, and Exchange workloads. Array-to-array local and remote data copying enables multi-site disaster tolerance. World-class service and support meets your most demanding needs.

In a world where every business decision triggers an IT event, the XP12000 enables an adaptive enterprise--one that can quickly capitalize on and manage change. The breadth of XP12000 capabilities allow you to demand more agility to adapt to real-time business needs, more value by ensuring your information is protected and available, and more simplicity by reducing costs through consolidation and management efficiency.



What's New

Functionality Element	XP12000
Scalability	<ul style="list-style-type: none">• 300 GB 10K rpm disk drives• RAID 6 (6D+2P)• Over 332 TB of internal capacity

Models

HP StorageWorks XP12000 Disk Array SSP	AE001A
NOTE: For new XP12000 orders.	
HP StorageWorks XP12000 Upgrade SSP	AE070A
NOTE: For XP12000 upgrade orders.	

Key Features and Benefits



Overview

HP StorageWorks XP12000 Disk Array is ideal for enterprise customers requiring the highest level of scalability, availability, disaster recovery, business continuity solutions, and guaranteed uptime service levels. The level of service provided by the XP12000 could be compared to the level of service from HP Nonstop servers or high-end Superdome servers. The XP12000 is an excellent solution for customers with applications that cannot afford any downtime -- where business demands this level of service. The XP12000 also supports the largest number of operating systems and offers very robust solutions. Plus you can manage up to 165TB in one box with one interface that controls it all.

Reliability

- The XP12000 provides always-on reliability with no single-point-of-failure and redundant hot-swappable components, including: disk drives, fans, processors, I/O interfaces, power supplies, batteries and control processors.
- This redundancy is further enhanced by the inherent RAID technology, which includes RAID 5 7D+1P that provides 87.5% efficiency (i.e., only 12.5% overhead required).
- The XP12000 is also networked to HP's "Storage Technology Center" and is constantly being monitored by HP for any potential issues, so they can be proactively addressed before they can cause a problem.

Availability

Continuous availability is a vital requirement for most companies today. The costs associated with system downtime are skyrocketing. The XP12000 enables 24×7 operation in several ways:

- RAID technology and redundant data paths ensure that there is no single point-of-failure, virtually eliminating the likelihood of unplanned shutdown. If one of the two data paths fails, the other path takes over automatically. HP's "Storage Technology Center" is alerted to any problem, and that problem is quickly fixed with a minimum of stress while all data remains accessible.
- The XP12000 offer a painless growth path; it can be upgraded without ever taking the system down, so you can add capacity as required without disrupting business operations. In addition, HP's management software makes it easy to manage several additional arrays from a single console, so your storage capacity can grow without increasing demands on administrative staff.
- Integration with Business Copy XP, Continuous Access XP, Cluster Extension XP, and many 3rd party clustering software enables continuous operation over multiple sites to protect against a local disaster.
- In case you need to restore data after a physical disaster, data-mirroring techniques of HP's Business Copy XP and Continuous Access XP software with full integration within HP OpenView Data Protector backup management software ensures that you can rapidly restore your data and return to normal operation quickly and efficiently.
- Zero-downtime backup solutions, Instant Recovery solutions, and online upgrade enable data protection and scaling with no disruption of service.
- Nickel-Hydride batteries maintain system power for up to one minute during power outages allowing for uninterrupted service.
- If the power outage is longer than one minute, data is destaged to disk or battery protected in Cache or Shared Memory for at least 48 hours.

Scalability

The XP12000 allows you to start with the configuration you need today and scale to the highest usable capacity of any disk array as your needs grow. Scalable from 9 drives to 1152 and to over 332 TB of raw storage capacity inside a single array. This scalability permits organizations to accommodate constant growing storage needs without ever having to upgrade the box.

- Online upgrades allow for no interruptions to applications and never require a full-box/forklift upgrade
- 1152 disk drives with 128 drives in the center DKC cabinet and up to 256 drives in each DKU cabinet (4 DKU's max)
- Over 332 TB of internal capacity, 30 PB of external capacity, 128 GB of Cache, and 12 GB of Shared Memory

Overview

	MIN	INCREMENT	MAX
Data Drives	8	4	1148
Spare Drives	1	1	40
Capacity	576 GB raw 288 GB usable	-	165 TB raw 144 TB usable
ACP Pairs	1	1	4
Cache	4 GB	4 GB	128 GB
Cache Bandwidth	17 GB/s	17/34 GB/s	68 GB/s
Shared Memory	1 GB	1 GB	6 GB
Shared Memory Bandwidth	7.5 GB/s	7.5 GB/s	13 GB/s
Host Ports	8	8/16/32	128
LDEVs	1	1	8192
Frames	1	1	5

Low Cost of Ownership

The XP12000 provides a low total cost of ownership when all factors are considered -- great price/performance ratio, increased productivity via higher throughput speeds, zero downtime, compact footprint to conserve floor space, and ease of management. In addition, connectivity to low cost external storage as well as the ability to consolidate proliferated storage allows you to more fully utilize storage assets and improve the quality of storage services that IT offers to the enterprise.

External storage

The XP12000 supports external storage capacity by connecting to HP XP or MSA disk arrays, as well as 3rd party disk arrays.

Legacy XP1024, XP128, XP512, XP48, XP256, MSA1500, MSA1000 and 3rd party arrays from EMC, IBM, and HDS can be connected as external storage that appear as LUNs on the XP12000

- External storage devices must be from a list of tested and supported devices
- Any Fibre Channel port from any CHIP pair installed in any slot can be used to connect to external storage

Consolidation

Consolidating storage onto the XP12000 allows companies to dramatically reduce the high maintenance of managing proliferated storage. Costs of managing multiple storage units include downtime, technician time, storage procurement, consumption of supplies, labor hours, and increased utilities expenses to produce usable outcomes.

Performance

The XP12000 offers industry-leading performance at high capacity points through which customers can achieve outstanding levels of random I/O support for database, OLTP, data warehousing and other I/O intensive applications. The performance of the XP12000 surpasses the current fastest array on the market (XP1024) by 2 to 4 times, as shown in the Family Information table found later in this document.

- Max Sequential Performance = 8.0 GB/s
- Max Random Performance Cache = 1,900,000 IOPS
- Max Random Performance Disk = 120,000 IOPS
- Max Data Bandwidth = 68 GB/s
- Max Control Bandwidth 13 GB/s

Overview

Heterogeneous Connectivity

A wide variety of servers and operating systems can be connected to an XP disk array
HP-UX

- Windows - W2K, 2003
- LINUX - IA2, Red Hat
- HP OpenVMS
- HP NonStop
- Mainframe
- HP Tru64 UNIX
- IBM AIX
- Sun Solaris
- Dynix PTX, NCR

The XP12000 can be connected through all popular host interconnections

- Fibre Channel
- FICON
- ESCON

Redundancy

Fully redundant components with no single point of failure

Power redundancy, two to four connections to AC power with different sources, using single-phase or three-phase in 50- or 60-Hz

Manageability

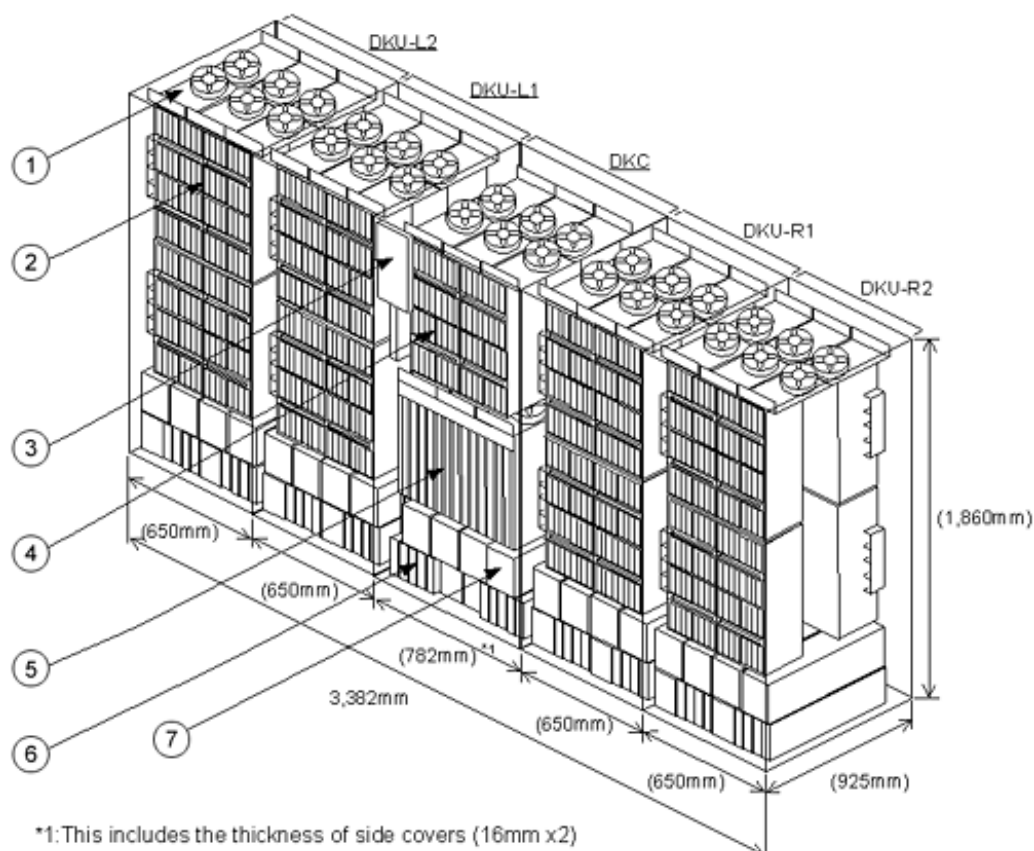
Multiple arrays and hundreds of terabytes can be managed from a single web-based management station - by existing staff

Cache and Shared Memory

Mirrored Cache with battery backup expandable from 4 GB up to 128 GB

Shared Memory with battery backup, expandable from 1 GB to 12 GB, stores command and control data so that the entire amount of Cache Memory is available for quick access to user data access to user data

Standard Features



- | | |
|---------------------|-----------------|
| 1. Fan | 5. DKC Box |
| 2. HDU Box | 6. Battery Box |
| 3. Control Panel | 7. Power Supply |
| 4. HDU-Box (DKU-R0) | |

XP12000 Hardware

The XP12000 hardware consists of a Disk Control Frame (DKC) that will hold up to 128 disks, and one to four optional Disk Array Frames (DKUs) for the remaining disks.

The DKC contains the control panel, service processor (SVP), cache modules, shared memory modules, crossbar switch, batteries for cache, and shared memory backup, Client-Host Interface Processors (CHIPs), and Array Control Processors (ACPs).

The DKUs hold the majority of the disk drives and can hold up to 256 physical disks. Unlike the XP1024, the XP12000 can be used with only the controller cabinet. Up to four disk cabinets can be added to each XP12000.

XP12000 Software

A full complement of software tools are available for XP12000 Disk Array management, management integration, and to enable a wide range of High Availability solutions. Please see the "HP StorageWorks XP Disk Array Software Products" QuickSpecs for further information:

http://h18000.www1.hp.com/products/quickspecs/12066_div/12066_div.HTML (Worldwide)

http://h18000.www1.hp.com/products/quickspecs/12066_na/12066_na.HTML (North America)

Standard Features

Server connectivity	The XP12000 connects to a variety of servers and operating systems. For details on which servers and operating systems are currently supported, please contact your resellers and your HP technical support to review the supported server and operating system information.
Client Host Interface Processors (CHIPs)	<p>Client Host Interface Processors (CHIPs) provide connections to host or servers that use the XP12000 for data storage (either directly connected to the servers or through SAN switches). The CHIPs are configured in pairs for redundancy. The XP12000 can have one, two, three, or four pairs of CHIPs.</p> <p>CHIP pairs available for use in the XP12000 include:</p> <ul style="list-style-type: none">• 16 and 32 port 1 to 2 Gbps Auto sensing short-wave and long-wave Fibre Channel with Continuous Access support• 16 port ExSA Channel (ESCON compatible)• 8 port 1 to 2 Gbps auto-sensing FICON in both short-and long-wave versions
Array Control Processor (ACP)	The Array Control Processor (ACP) performs all data movement between the disks and cache memory. The ACP also provides data protection through the use of RAID 1 and RAID 5. Each ACP has eight 2 GB FC-AL loops (compared to four 1 GB/s loops in the XP1024/XP128), or 16 loops total per pair, and supports up to 48 disk drives per loop. The ACP is configured in pairs for redundancy. The XP12000 can have one, two, three, or four pairs of ACPs.
Cache memory	<p>Cache memory is used to temporarily store data from the host until it is written to disk, or to stage data requested by the host from the disk. The XP12000 cache memory modules are installed on Cache Platform Boards:</p> <ul style="list-style-type: none">• The basic Cache Platform Board pair supports up to 16 sets of cache modules (up to 64 GB).• The optional Additional Cache Board Pair supports up to 16 additional sets of cache modules (up to an additional 64 GB). <p>The cache is configured as two sets of memories, onto which data that is to be written on the disk is mirrored, so the data will not be lost even if a cache failure occurs.</p>
Shared memory	<p>Shared memory is independent of the cache memory and is used to store tables, side files, and other information, thus freeing up the cache memory for user data. Shared memory is also used to store system configuration information. The configuration information includes system components mapping, LUN maps, cache pointers, and RAID levels.</p> <p>All shared memory is backed up by a fully redundant 48 hour battery.</p>
Switch support details	The XP12000 connects to the leading Fibre Channel switches in the industry today. For detailed information on supported switch configurations, please contact your sales representative.

Standard Features

Nickel-Hydride Batteries The XP12000's power fail strategy provides for environmental-friendly Nickel-Hydride batteries, which continues array operations for up to one minute. When the duration of the power loss is longer than one minute, the XP12000 executes either the De-stage Mode and moves all data to disk, or the Backup Mode, protecting data in cache and shared memory for at least 48 hours. The base DKC contains sufficient battery back-up for the first 16 sets of cache modules. The Additional Cache Battery is required when more than 16 sets of cache modules are installed.

High Storage Density Consolidating storage onto an XP allows critical data center floor space to be maximized. Having 332 TB (1152 300 GB disk drives) in 3.128 square meters (33.67 square feet) of cabinet floor space provides an incredible density of 106 terabytes per square meter (9.86 terabytes per square foot)!

Software Components

Software Features When disaster strikes, it can mean much more than a temporary loss of computing power. Work delays, data degradation and data loss can quickly translate into lost revenue, lost profits, and lost customers. HP provides a range of solutions that address varying degrees of availability and scalability.

These solutions range from

- Internal Mirrors – Business Copy XP
- Path Management – Auto Path XP (AIX, Solaris), Secure Path XP (HP-UX, Windows, Linux)
- Clustering – Local Cluster Solutions
- Remote Mirrors – Continuous Access XP
- Long Distance Clusters – Cluster Extension XP
- Worldwide Clusters – Continental clusters

A full complement of software tools are available for XP12000 Disk Array management, management integration, and to enable a wide range of High Availability solutions. Please see the “HP StorageWorks XP Disk Array Software Products” QuickSpecs for further information:

http://h18000.www1.hp.com/products/quickspecs/12066_div/12066_div.HTML (Worldwide)

http://h18000.www1.hp.com/products/quickspecs/12066_na/12066_na.HTML (North America)

Service and Support, HP Care Pack, and Warranty Information

Service and Support

HP Care Pack Services offer upgraded service levels to extend and expand your standard product warranty with easy to buy, easy to use support packages that help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements, from basic to mission-critical. They help you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

Why purchase an HP Care Pack service?

- Your standard warranty protects against product defects. HP Care Pack Services help you guard against unplanned downtime, which can reduce your productivity and profitability. These convenient service packages:
- Protect your investment in HP products
- Provide consistent, predictable levels of support across your entire department or business
- Ease budget planning with fixed-cost support that includes parts and labor
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Deliver prompt, measurable results
- Are available whenever and wherever you do business

NOTE: HP Care Pack availability may vary by country and product.

Supporting your Adaptive Enterprise journey

HP Services helps you make the Adaptive Enterprise real for your organization. The breadth, depth, and quality of HP hardware and software support services can help you **improve the performance** of your IT support processes and resolve the complex software and hardware problems that tax user productivity. HP Care Pack services help you **increase IT environment stability, efficiency, and agility** from the desktop to the data center, and improve the productivity of your employees.

Warranty and Services Included with the Product

Services included with the XP12000:

- Hardware site preparation.
- Array installation and start up.
- Warranty level of hardware reactive support is 2 years, 24×7, 4 hour response on critical repairs. Next calendar day response for all other repairs.
- Proactive 24 proactive services
- Software support-1 year of 24×7 support services, which includes LTU, right to new versions, documentation, phone in assistance and access to the IT Resource Center
- Software enablement is bundled in with each individual software title.

Service and Support, HP Care Pack, and Warranty Information

HP Proactive 24 Service is an integrated hardware and software support solution designed to help you get more from your IT investment. It combines industry-leading preventive assistance with responsive support that helps you address problems quickly and effectively.

- Assigned account manager who is your primary contact for proactive services and access to HP's diverse technical resources
- Your account manager works closely with your IT staff to understand your environment and goals; document all the components of your infrastructure; recommend changes to improve availability, performance, and stability; and monitor ongoing operations using state-of-the-art remote tools
- Comprehensive 24 x 7 assistance
- 1 year 2-hour response for software issues, includes phone-in assistance, License to Use, rights to new versions, documentation and access to the IT Resource Center
- 2 years onsite response for hardware problems; 4-hour response for critical problems, next calendar day response for all other repairs.

HP warrants only that the Software media will be free of physical defects for a period of ninety (90) days from delivery.

For more information about HP's Global Limited Warranty and Technical Support, visit

ftp://ftp.compaq.com/pub/products/storageworks/warranty/EN_321708-008.pdf

Recommended Services

- 3 Years - HP Proactive 24 Service
 - Easily extends support of your environment to three full years
- HP Support Plus 24 Service is recommended to cover any devices used as external storage that will appear as a LUNs on the XP12000
- Data Replication service
 - Accelerate your time-to-ROI with HP implementation and integration expertise
 - Enjoy rapid results when you deploy industry-leading HP Data Replication technologies
 - Provides optimal solution to meet your IT and business needs via flexible scalable services

Available HP Care Pack Services Extend your product warranty with a wide choice of cost-saving support packages.

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools. Additional information about HP Care Pack Service features and benefits is available at <http://www.hp.com/hps/carepack/services/>.

Key for HP Care Pack Service availability in the table below:

E = Service available for customers purchasing direct and via enterprise resellers

C = Service available for customers purchasing via commercial resellers

NA = Service not applicable

HP Care Pack Services Deployment and Per Event Services	Service Available
HP Installation	NA
HP Installation & Startup	Included with HW
HP Implementation	Included with most SW titles
HP Data Replication Solution Service	E

For more information about Deployment and Per Event Services for HP Storage, visit

<http://www.hp.com/hps/storage/>.

Service and Support, HP Care Pack, and Warranty Information

HP Care Pack Services Availability Services	1 yr	3 yr	4 yr	5 yr
HP Proactive 24 Service	Included	E	E	E
HP Critical Service	E	E	E	E

Deployment and Per Event Service Descriptions

- XP Performance Tuning and Optimization
 - Ongoing analysis and tuning designed to keep your array running efficiently.
- XP Performance Analysis
 - Provides data collection, detailed I/O analysis, and enhancement recommendations for the XP Disk Array.
- High Availability Storage Assessment
 - Identify potential risks to business success that may exist in your XP Storage/SAN environment.
- Availability Assessment for SANs
 - Recommendations for reducing or eliminating risks to the availability of your SAN infrastructure.
- SAN Solution Service
 - You get a powerful network storage solution up-and-running quickly and efficiently, with minimal disruption and rapid returns on your SAN investment.
- HP Open Systems Data Migration
 - Transfers your critical information to a new or reconfigured storage array in an open systems environment - across a data center or around the world.
- HP Open Systems Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Open Systems Data Migration Service.
- HP Mainframe Data Migration
 - Transfers your critical information to a new or reconfigured storage array in a mainframe environment - across a data center or around the world.
- HP Mainframe Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Data Migration Mainframe Service.
- HP Mixed Environment Data Migration
 - Transfers your critical information to a new or reconfigured storage array in a mixed mainframe and open systems environment - across a data center or around the world.
- HP Mixed Environment Data Migration Extension
 - Accommodates additional capacity to be migrated beyond what is included in the base HP Data Migration Mixed Environment Service.
- LUN Implementation for XP
 - When redeploying your storage array, this service maximizes effectiveness by providing the necessary activities to implement a new LUN or Virtual Disk (Vdisk) configuration.
- Data Replication Solution Service
 - Ensures a timely, cost-effective deployment of your data replication solution that cuts risk and shortens your time-to-results.

Service and Support, HP Care Pack, and Warranty Information

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit <http://www.hp.com/support>

Instant Support Enterprise Edition (ISEE)

HP Instant Support Enterprise Edition (ISEE) provides a single remote monitoring and support solution for your IT data center. ISEE uses continuous hardware event monitoring and automated notification to identify and prevent potential critical problems.

ISEE is a feature of HP Hardware Support Onsite Service with Next-Day response or better, Proactive Essentials, Proactive 24, Critical Service and warranty support for the selected products.

For more information or to download ISEE, visit <http://www.hp.com/go/instantsupport>

HP Education Services

Managing The HP StorageWorks XP Disk Array H6773s

<http://education.hp.com/datasheets/h6773s.pdf>

For more information about HP Education Services for Storage and SAN, visit

<http://education.hp.com/curr-storsan.htm>

Awards

HP IT Resource Center (ITRC) and HP Business Support Center (BSC) were selected as two of the Association of Support Professional's (ASP) Top Ten award winners in its seventh annual Ten Best Web Support Sites competition for 2004, an award that showcases excellence in online service and support.

<http://www.hp.com/hpinfo/newsroom/press/2004/040616a.html>

HP earned the No. 1 ranking in customer satisfaction among vendors of corporate information technology (IT) service and support, according to the newly released Technology Business Research Inc.'s Corporate IT Service and Support survey covering the first quarter of 2004.

<http://www.hp.com/hpinfo/newsroom/press/2004/040624a.html>

Additional Services Information

For more information about Deployment, Per Event, Consulting and Education services for HP Storage, visit: <http://www.hp.com/hps/storage/>

For more information about HP Care Pack Services for Storage, visit:

http://www.hp.com/hps/carepack/storage/cp_networked.html

For more information about HP Storage Software, services and updates, visit:

<http://h18006.www1.hp.com/storage/software.html>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Family Information

Functionality Element	XP12000	XP1024	XP128
Max Sequential Performance	8.0 GB/s	2.1 GB/s	1.2 GB/s
Max Random Performance Cache	1,900,000 IOPS	544,000 IOPS	272,000 IOPS
Max Random Performance Disk	120,000 IOPS	66,000 IOPS	33,000 IOPS
Max Data Bandwidth	68 GB/s	10 GB/s	5 GB/s
Max Control Bandwidth	13 GB/s	5 GB/s	2.5 GB/s
Max Raw Capacity	332 TB + External Storage	149 TB	36 TB
Max Usable Capacity (RAID 5 7D + 1P)	290 TB + External Storage	129 TB	32 TB
Max Cache	128 GB	128 GB	64 GB
Host System Interface	2 Gb FC ESCON 2 Gb FICON	2 Gb FC iSCSI ESCON 2 Gb FICON	2 Gb FC iSCSI ESCON 2 Gb FICON
RAID levels supported	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P) RAID 6 (6D + 2P)	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P)	RAID 1 (2D + 2D) RAID 1 (4D + 4D) RAID 5 (3D + 1P) RAID 5 (7D + 1P)
Drive Interface	2 GBPS FC-AL Dual Active Ports	1 GBPS FC-AL Dual Active Ports	1 GBPS FC-AL Dual Active Ports
Drive Capacity	73 GB 15K rpm 146 GB 10K rpm 300 GB 10K rpm	36 GB 15K rpm 73 GB 10K rpm 73 GB 15K rpm 146 GB 10K rpm 300 GB 10K rpm	36 GB 15K rpm 73 GB 10K rpm 73 GB 15K rpm 146 GB 10K rpm 300 GB 10K rpm
Disk Drives	1152	1024 (512 300 GB disks)	128
External storage capability	XP1024, XP128, XP512, XP48, and MSA1000	None	None
Online firmware update	One CHIP processor at a time keeps all ports operating with no host port interruption	One CHIP blade at a time keeps the other blade operating, may interrupt a host with a single connection	One CHIP blade at a time keeps the other blade operating, may interrupt a host with a single connection
Battery Type	Nickel-Hydride batteries maintain system power for up to one minute during power outages allowing for uninterrupted service	Batteries that maintain cache and shared memory during outages	Batteries that maintain cache and shared memory during outages
	*3rd party arrays used as external storage require a support contract from the supplier		

Configuration Information

An extensive list of accessories is available for this product. For more information, please contact your reseller or authorized HP representative to work with the requirements to configure the product correctly.

Base Configurations - HP StorageWorks XP12000 Disk Array SSP

AE001A

NOTE: SSP = Structured Solution Product. This product number (AE001A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is a new XP order.

HP StorageWorks XP12000 DKC component options

AE002A

XP12000 Disk Control Frame (DKC) (Supports up to 128 disk drives. Contains Basic Redundant Power Supplies, base batteries for up to 64GB cache and up to 64 disk drives, HP microcode, HP Continuous Track XP, Modem and pcAnywhere. **Does not provide basic ACP**) (1 required per XP system). Must select one power option.

3-Phase 30A/60Hz for XP12000 DKC

AE002A#001

Power Cable Kit 3-Phase/30A/60Hz DKC-DKU

AC Box Kit, 3-Phase/30A, DKC-DKU

3-Phase 30A/50Hz for XP12000 DKC

AE002A#002

Power Cable Kit 3-Phase/30A/50Hz DKC-DKU

AC Box Kit, 3-Phase/30A, DKC-DKU

1-Phase 50A/60Hz for XP12000 DKC

AE002A#003

Power Cable Kit 1-Phase/50A/60Hz DKC-DKU

AC Box Kit, 1-Phase/50A, DKC-DKU

1-Phase 50A/50Hz for XP12000 DKC

AE002A#004

Power Cable Kit 1 Phase/50A/50 Hz DKC-DKU

AC Box Kit, 1-Phase/50A, DKC-DKU

1-Phase 30A/60Hz for Std XP12000 DKC

AE002A#005

Power Cable Kit 1-Phase/30A/60Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

1-Phase 30A/50Hz for Std XP12000 DKC

AE002A#006

Power Cable Kit 1-Phase/30A/50Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

1-Phase 30A/60Hz for Min XP12000 DKC

AE002A#007

Power Cable Kit 1-Phase/30A/60Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

1-Phase 30A/50Hz for Min XP12000 DKC

AE002A#008

Power Cable Kit 1-Phase/30A/50Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

SVP High Reliability Support Kit (min 0, max 1)

AE003A

XP12000 SVP High Reliability Sup. Kit

Power Control Interface Kit for Mainframe Kit (min 0, max 1)

AE004A

XP12000 Power Control I/F Kit for MF

Client-Host Interface Processor pairs (Min 1 pr, Max 4 pr)

XP12000 16-Port 1-2Gbps FC SW CHIP pr

AE006A

XP12000 32-Port 1-2Gbps FC SW CHIP pr

AE007A

Configuration Information

XP12000 FC SFP Transceiver LW	AE008A
XP12000 8-Port 1-2Gbps FICON SW CHIP Pr	AE013A
XP12000 8-Port 1-2Gbps FICON LW CHIP Pr	AE014A
XP12000 16-Port EXSA CHIP Pair	AE017A

Additional DKC Power Supply (Min 0, Max 1)

NOTE: Required when CHIPs plus ACPs = 4 or more, or, when 68GB or more cache, or, when 65 or more disk drives are installed)

XP12000 DKC Power Supply	AE024A
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Cache Memory (Min 4GB, Max 128 GB)

NOTE: Must order Cache Data Path Expansion kit AE027A for high performance cache configurations, or, for cache greater than 64GB. Must configure cache in increments of 8 GB when Expansion kit AE027A is installed.

XP12000 4 GB Cache Memory Module	AE025A
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Cache Data Path Expansion kit (Min 0, Max 1)

NOTE: Required for all high performance cache configurations or required for cache above 64GB.

XP12000 Cache Platform Board	AE027A
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DKC-DKU Additional Battery (Min 0, Max 2 for DKC, Max 2 per DKU Frame)

NOTE: 1 required for DKC when 68GB or more cache or with 65 or more disk drives installed. 2nd required for DKC under any of the 3 following conditions: CHIPs plus ACP is 4 or greater, or, AE027A/AU is installed. 2 required for DKU with 129 or more disk drives.

XP12000 DKC-DKU Battery	AE028A
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Shared Memory (Min 1GB, Max 12GB)

XP12000 1GB Shared Memory Module	AE030A
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DKC Data Path Expansion kit (Min 0, Max 1)

NOTE: 1 required if installing 3rd or 4th CHIP pairs, or, if installing CHIPs or ACPs in 3rd or 4th ACP locations.

XP12000 Cache Switch	AE033A
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Array Control Processor (Min 0, Max 4)

NOTE: No intermixing. Max ACP is reduced by 1 for every CHIP pr above 4.

XP12000 Standard Performance ACP Pair	AE034A
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DKC-DKU and DKU-DKU Frame Interconnect Cables

XP12000 Cable set for DKU R1-Basic	AE040A
XP12000 Cable set for DKU R1-High Perf	AE041A
XP12000 Cable set for DKU L1 - Basic	AE042A
XP12000 Cable set for DKU L1-High Perf	AE043A
XP12000 Cable Set for DKU R2 or L2	AE044A

Configuration Information

XP12000 Disk Array Frame (DKU)

AE045A

Disk Array Frame (Min 0, Max 4) Must select one option and must match Power option of DKC (except DKU#005 and #006 are compatible with DKC #007 and #008 respectively, otherwise, no intermixing of power options). Base DKU includes batteries for up to 128 disk drives.

3-Phase 30A/60Hz for XP12000 DKU

AE045A#001

Power Cable Kit 3-Phase/30A/60Hz DKC-DKU

AC Box Kit, 3-Phase/30A, DKC-DKU

3-Phase 30A/50Hz for XP12000 DKU

AE045A#002

Power Cable Kit 3-Phase/30A/50Hz DKC-DKU

AC Box Kit, 3-Phase/30A, DKC-DKU

1-Phase 50A/60Hz for XP12000 DKU

AE045A#003

Power Cable Kit 1-Phase/50A/60Hz DKC-DKU

AC Box Kit, 1-Phase/50A, DKC-DKU

1-Phase 50A/50Hz for XP12000 DKU

AE045A#004

Power Cable Kit 1 Phase/50A/50 Hz DKC-DKU

AC Box Kit, 1-Phase/50A, DKC-DKU

1-Phase 30A/60Hz for XP12000 DKU

AE045A#005

Power Cable Kit 1-Phase/30A/60Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

1-Phase 30A/50Hz for XP12000 DKU

AE045A#006

Power Cable Kit 1-Phase/30A/50Hz DKC-DKU

AC Box Kit, 1-Phase/30A, DKC-DKU

Disk Data Path Sets

NOTE: Min 0, Max 1 per DKU frame

XP12000 High Perf FC-AL Disk Path

AE046A

XP Disk Drives Array Groups. Qty (2) DKC-DKU

NOTE: Additional Battery (AE028A) required for each DKU with more than 32 Array Groups.

XP12000 73GB 15k rpm Array Group-4 disks

AE050A

XP12000 146GB 10k rpm Array Group-4 disks

AE051A

XP12000 300GB 10k rpm Array Group-4 disk drives

AE053A

Spare Disk Drives

NOTE: Min of one required for each Array Group type

XP12000 73GB 15k rpm Spare Disk

AE050AS

XP12000 146GB 10k rpm Spare Disk

AE051AS

XP12000 300GB 10k rpm Spare Disk

AE053AS

Upgrade Configurations - HP StorageWorks XP12000 Upgrade SSP

AE070A

NOTE: SSP = Structured Solution Product. This product number (AE070A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is a new XP order.

Configuration Information

HP StorageWorks XP12000 DKC component options

XP12000 1-Phase 30A/60Hz DKC Pwr upgd	AE068AU
Power Cable Kit 1-Phase/30A/60Hz DKC-DKU	
XP12000 1-Phase 30A/50Hz DKC Pwr upgd	AE069AU
Power Cable Kit 1-Phase/30A/50Hz DKC-DKU	
XP12000 SVP High Reliability Kit, upgd	AE003AU
XP12000 Pwr Control I/F Kit for MF, upgd	AE004AU
XP12000 16-Port FC SW CHIP pr, upgd	AE006AU
XP12000 32-Port FC SW CHIP pr, upgd	AE007AU
XP12000 FC SFP Transceiver LW, upgd	AE008AU
XP12000 FC SFP Transceiver SW, upgd	AE009AU
XP12000 8-Port FICON SW CHIP pr, upgd	AE013AU
XP12000 8-Port FICON LW CHIP pr, upgd	AE014AU
XP12000 16-Port EXSA CHIP Pair, upgd	AE017AU
XP12000 DKC Power Supply, upgd	AE024AU
XP12000 4GB Cache Memory Module, upgd	AE025AU
XP12000 Cache Platform Board, upgd	AE027AU
XP12000 DKC-DKU Battery, upgd	AE028AU
XP12000 1GB Shared Memory Module, upgd	AE030AU
XP12000 Shared Memory Platform Board, upgd	AE032AU
XP12000 Cache Switch, upgd	AE033AU
XP12000 Standard Performance ACP Pair, upgd	AE034AU
XP12000 Cable set for DKU R1-Basic, upgd	AE040AU
XP12000 Cable set, DKU R1-High Perf, upgd	AE041AU
XP12000 Cable set for DKU L1-Basic, upgd	AE042AU
XP12000 Cable set, DKU L1-High Perf, upgd	AE043AU
XP12000 Cable Set for DKU R2 or L2, upgd	AE044AU

HP StorageWorks XP12000 DKU component options

XP12000 Disk Array Frame (DKU), upgd	AE045AU
3-Phase 30A/60Hz for XP12000 DKU, upgd	AE045AU#001
Power Cable Kit 3-Phase/30A/60Hz DKC-DKU	
AC Box Kit, 3-Phase/30A, DKC-DKU	
3-Phase 30A/50Hz for XP12000 DKU, upgd	AE045AU#002
Power Cable Kit 3-Phase/30A/50Hz DKC-DKU	
AC Box Kit, 3-Phase/30A, DKC-DKU	
1-Phase 50A/60Hz for XP12000 DKU, upgd	AE045AU#003
Power Cable Kit 1-Phase/50A/60Hz DKC-DKU	
AC Box Kit, 1-Phase/50A, DKC-DKU	
1-Phase 50A/50Hz for XP12000 DKU, upgd	AE045AU#004
Power Cable Kit 1 Phase/50A/50 Hz DKC-DKU	
AC Box Kit, 1-Phase/50A, DKC-DKU	

Configuration Information

1-Phase 30A/60Hz for XP12000 DKU, upgd	AE045AU#005
Power Cable Kit 1-Phase/30A/60Hz DKC-DKU	
AC Box Kit, 1-Phase/30A, DKC-DKU	
1-Phase 30A/50Hz for XP12000 DKU, upgd	AE045AU#006
Power Cable Kit 1-Phase/30A/50Hz DKC-DKU	
AC Box Kit, 1-Phase/30A, DKC-DKU	
XP12000 High Perf FC-AL Disk Path, upgd	AE046AU
XP12000 73GB 15k Arry Grp-4 disks, upgd	AE050AU
XP12000 146GB 10k Arry Grp-4 disks, upgd	AE051AU
XP12000 300GB 10k Arry Grp-4 disk drives, upgd	AE053AU
XP12000 73GB 15k Spare Disk, upgd	AE050AT
XP12000 146GB 10k Spare Disk, upgd	AE051AT
XP12000 300GB 10k Spare Disk, upgd	AE053AT

Technical Specifications

Model	HP StorageWorks XP12000 Disk Array			
Number of Disk Drives	9 - 1152 in 1 to 5 cabinets (Disk Control Frame holds 128 disks and the Disk Array Frames hold 256 disks each)			
Disk Drives, Interface	Disk Drives, Capacity and Spindle Speed	73 GB - 15K rpm	146 GB - 10K rpm	300 GB - 10K rpm
	Rotational latency	2.01 ms	2.99 ms	2.99 ms
	Average Read/Write Seek Time	3.8/4.2 ms	4.9/5.4 ms	4.7/5.1 ms
	Internal data transfer rate	74.5 to 111.4 MB/sec	57.3 to 99.9 MB/sec	57.3 to 99.9 MB/sec
Capacity	576 GB - 332 TB raw 288 GB - 290 TB usable			
RAID Level	RAID 1 (2D + 2D, 4D + 4D) RAID 5 (3D + 1P, 7D + 1P) RAID 6 (6D + 2P)			
Maximum number of Logical Devices (LDEVs)	8,192			
Cache memory	4 GB - 128 GB			
Shared memory	1 GB to 6 GB			
Battery backup time	48 hours minimum			
Operating Systems	HP-UX, Tru64, Open VMS, NonStop, Solaris(8,9), AIX(5.1, 5.2), AIX(4.3.3, 5L), Windows (2000, 2003), NetWare(6.0), IRIX64(6.5.16), Linux(3.0), Mainframe			
Host Interface	Fibre Channel, ESCON, FICON			
Host Ports	8 to 128 by increments of 8/16/32			
Drive Interface	Dual ported 2 GBPS Fibre Channel Arbitrated Loop (FC-AL)			
Regulatory Approvals	This product meets all applicable safety and regulatory specifications			
Physical Dimensions - Disk control frame (DKC)	Width x Depth x Height	30.8 x 36.4 x 73.2 in (78.2 x 92.5 x 186.0 cm)		
	Max Weight	1930 lb (877 kg)		
Physical Dimensions - Disk array frame (DKU)	Width x Depth x Height	25.6 x 36.4 x 73.2 in (65.0 x 92.5 x 186.0 cm)		
	Max Weight	1630 lb (741 kg)		
Shipping Dimensions - Disk control frame (DKC)	Width x Depth x Height	37.4 x 43.7 x 79.9 in (95.0 x 111.0 x 203.0 cm)		
	Max Weight	2180 lb (988.8 kg)		
Shipping Dimensions - Disk array frame (DKU)	Width x Depth x Height	37.4 x 43.7 x 79.9 in (95.0 x 111.0 x 203.0 cm)		
	Max Weight	1880 lb (852.7 kg)		

Heat Dissipation and Power Consumption Specifications

Parameter	DKC	Each DKU	Full Array (4 DKUs and 1 DKC)
Power consumption (kVA)	8.45	7.50	38.45
Heat dissipation (kW)	8.02	6.75	35.02
BTUs per hour	27370	23036	119514
Kcal per hour	6897	5805	30117

Technical Specifications

DKC AC line voltage requirements

50-amp, 50 or 60 Hz, Single-phase DKC operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	212	220	233	244	254
Rated line current per power cord (Arms)	8.0	7.7	7.2	7.0	6.6
Number of power cords	2	2	2	2	2
Number of circuit breakers	2	2	2	2	2
Recommended circuit breakers	50A	50A	50A	50A	50A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30
* 60 Hz only					

30-amp, 50 or 60 Hz, Single-phase DKC operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	212	220	233	244	254
Rated line current per power cord (Arms)	4.0	3.9	3.6	3.5	3.3
Number of power cords	4	4	4	4	4
Number of circuit breakers	4	4	4	4	4
Recommended circuit breakers	30A	30A	30A	30A	30A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30
* 60 Hz only					
** Units with only two power cords require only two circuit breakers					

30-amp, 50 or 60 Hz, Three-phase DKC operation

Parameter	Nominal Rated Voltage (VAC)							
	200	208*	220	230	240	380	400	415
Minimum operating voltage (VAC)	184	191	202	212	221	350	368	382
Maximum operating voltage (VAC)	212	220	233	244	254	403	424	440
Rated line current per power cord (Arms)	5.2	5.0	4.7	4.6	4.3	2.7	2.6	2.5
Number of power cords	2	2	2	2	2	2	2	2
Number of circuit breakers	2	2	2	2	2	2	2	2
Recommended circuit breakers	30A	30A	30A	30A	30A	30A	30A	30A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30	30	30	30
* 60 Hz only								

Technical Specifications

DKU AC line voltage requirements

50-amp, 50 or 60 Hz, Single-phase DKU operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	212	220	233	244	254
Rated line current per power cord (Arms)	22.3	21.6	20.3	19.4	18.6
Number of power cords	2	2	2	2	2
Number of circuit breakers	2	2	2	2	2
Recommended circuit breakers	50A	50A	50A	50A	50A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30
* 60 Hz only					

30-amp, 50 or 60 Hz, Single-phase DKU operation

Parameter	Nominal Rated Voltage (VAC)				
	200	208*	220	230	240
Minimum operating voltage (VAC)	184	191	202	212	221
Maximum operating voltage (VAC)	212	220	233	244	254
Rated line current per power cord (Arms)	13.5	13.0	12.3	11.7	11.2
Number of power cords	4	4	4	4	4
Number of circuit breakers	4	4	4	4	4
Recommended circuit breakers	30A	30A	30A	30A	30A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30
* 60 Hz only					
** Units with only two power cords require only two circuit breakers					

30-amp, 50 or 60 Hz, Three-phase DKU operation

Parameter	Nominal Rated Voltage (VAC)							
	200	208*	220	230	240	380	400	415
Minimum operating voltage (VAC)	184	191	202	212	221	350	368	382
Maximum operating voltage (VAC)	212	220	233	244	254	403	424	440
Rated line current per power cord (Arms)	15.0	14.4	13.6	13.0	12.5	8.8	8.4	8.1
Number of power cords	2	2	2	2	2	2	2	2
Number of circuit breakers	2	2	2	2	2	2	2	2
Recommended circuit breakers	30A	30A	30A	30A	30A	30A	30A	30A
Dropout carry-through time at minimum line voltage (ms)	30	30	30	30	30	30	30	30
* 60 Hz only								

Technical Specifications

Acoustics

The acoustic emission specifications for the disk array are:

- 8.27 Bels (A) sound power
- 65 dB (A) sound pressure, operator position (1 meter from the floor and surface of the cabinet)

Environmental Specifications

Item	Condition		
	Operating	Non-operation	Shipping & Storage
Temperature (°C)	16 ~ 32	-10 ~ 43	-25 ~ 60
Relative Humidity (%)	20 ~ 80	8 ~ 90	5 ~ 95
Max. Wet Bulb (°C)	26	27	29
Temperature Deviation (°C/hour)	10	10	20
Vibration	5~ 10Hz: 0.25mm 10~300Hz:0.05G	5~ 10Hz: 2.5mm 10~ 70Hz: 0.5G 70~ 99Hz: 0.05mm 99~300Hz: 1.0G	Sine Vibration: 0.5G, 5min. At the resonant frequency with the highest displacement found between 3~100Hz
			Random Vibration: 0.015G2/Hz, 30min. 5~100Hz
Shock	—	8G, 15ms	Horizontal: Incline Impact 1.22m/s
			Vertical: Rotational Edge 0.15m
Acoustic Level	65dB	—	—

Accessories

An extensive list of accessories is available for this product; for more information, please contact your HP sales representative

Safety

This product meets all applicable safety and regulatory specifications

Technical Specifications

Management Software	HP StorageWorks Command View XP
	HP StorageWorks LUN Configuration & Security Manager XP
	HP StorageWorks Performance Advisor XP
	HP StorageWorks Performance Control XP
	HP StorageWorks LUN Security XP Extension
	HP StorageWorks Cache LUN XP
	HP StorageWorks Auto LUN XP
	HP StorageWorks Data Exchange XP
	HP StorageWorks Business Copy XP
	HP StorageWorks Continuous Access XP/XP Extension/XP Journal
	HP StorageWorks External Storage XP
	HP StorageWorks Resource Manager XP
	HP StorageWorks RAID Manager XP
	HP StorageWorks Flex Copy XP
	HP StorageWorks Secure Path XP/Auto Path XP
	HP StorageWorks Cluster Extension XP
	HP StorageWorks XP Data Shredder
	HP StorageWorks XP Disk/Cache Partition
	HP StorageWorks Data Integrity Check XP
	HP OpenView Storage Area Manager
	HP OpenView Storage Data Protector
	HP OpenView Storage Media Operations

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